Health Economics Preliminary Examination, 2022

August 5, 2024

Instructions: Question 1 is required. Please answer two of the remaining four questions (i.e., from Questions 2-5). The exam is open book (i.e., you may refer to lecture notes, papers, and textbooks). Please complete the exam individually. You may not consult with anyone else on the questions or content. You may not use any sort of Artificial intelligence tools, such as ChatGPT, in any part of this exam. Please email back your exam to Ezra Golberstein (egolber@umn.edu) by 5pm. If you create any diagrams on paper that you wish to be included, please take a picture of the diagrams and send them to Ezra along with the rest of your exam.

Question 1.

A. Using the Rothchild-Stiglitz framework, describe the types of equilibria that can occur in insurance markets where consumers have heterogeneous risk types, under different assumptions about the insurer's knowledge of individuals' risk types. Feel free to use graphical illustration or mathematical exposition to help answer the question, but be sure to explain the intuition of your answer in words.

B. Suppose an insurer adopted a managed care technique like prior authorization to control utilization. How would that sort of technique get incorporated into the Rothchild-Stiglitz framework, and why?

C. A regulator can take a number of actions to help reduce adverse selection. Discuss one example of such a regulatory action. Describe how that action intends to reduce adverse selection, the strengths and weakness of that action with respect to reducing adverse selection, and any empirical evidence on the effects of that sort of action.

Question 2.

Artificial intelligence (AI) is rapidly entering clinical medicine. The U.S. Food and Drug Administration has approved more than 500 AI-enabled services that help clinicians diagnose and treat patients. One such innovation (that is covered and reimbursed by Medicare) is HeartFlow, an AI-enabled algorithm to diagnose coronary artery disease, using computed tomography (CT) scans. According to the manufacture, "HeartFlow offers a streamlined workflow that reduces unnecessary invasive testing and radiation exposure, and provides more accurate information about their condition compared to other non-invasive cardiac tests".

A. Describe how health economists characterize the effects of technological innovation, drawing on theory and empirical evidence. Informed by this, what changes (in spending, utilization, diagnosis, etc…) do you anticipate as clinicians adopt HeartFlow?

B. Propose a quasi-experimental (i.e., not a randomized controlled trial) research design to evaluate the effect of HeartFlow adoption on Medicare spending. What econometric assumptions are needed for a causal interpretation?

C. Imagine that you are CMS, redesigning Medicare reimbursement for HeartFlow. You are considering two options: reimbursing HeartFlow under a new procedure code or bundling reimbursement into existing payment for the CT scan (i.e., the input into the HeartFlow algorithm). What pros and cons do you see for both options?

Question 3.

There are many market failures in health care and health insurance.

A. Identify three market failures that lead to large costs in terms of economic inefficiency. In two or three paragraphs for each, explain the nature of the market failure. Your answer should make the case that the welfare costs of the market failure are high, using both theoretical arguments and empirical evidence.

B. Select one of the market failures. What public policies would effectively address this market failure? As in part (a), cite existing evidence to argue that the policy would be effective at improving economic efficiency. Please note that you may not "re-use" the answer to Question 1, Part C in this answer (i.e., you must select different examples of public policies).

Question 4.

"Global capitation" has emerged as a model of health care payment in recent years, where primary care organizations (for example, Oak Street Health and ChenMed) receive prospective risk-adjusted per-patient monthly payments, primarily from private Medicare Advantage plans. In return, the primary care organizations are financially responsible for **all** health care used by patients choosing to receive care from the organization (including hospital or emergency department care).

a. How do you predict that global capitation would affect the quantity of services provided to patients by primary care physicians relative to fee-for-service reimbursement? Under what circumstances would the level of services in global capitation fall below what is socially optimal for patient health?

b. Discuss two potential problems that could arise from unconstrained competition between primary care organizations under global capitation. What are regulations that could prevent these problems?

c. A hypothetical empirical analysis compared health service use among Medicare beneficiaries enrolled in global capitation compared to Medicare beneficiaries whose primary care providers received fee-for-service payment, controlling for observed patient health status. The analysis found lower overall health service use for global capitation patients and the authors concluded that global capitation reduced health care costs. Do you agree with this conclusion?

Question 5.

The country of Pharmastan wants to create a public insurance plan to make drugs more affordable. Use readings from the Health Economics seminar to provide a detailed answer to the following questions:

A. Although Pharmastan has a large drug manufacturing sector with firms producing a mixture of licensed and unlicensed branded and generic drugs, it has no patenting system. Should they create a patenting system? Why or why not? What effect would such a system have on prices, utilization, and the size of the pharmaceutical manufacturing sector?
B. The government of Pharmastan is considering a requirement that manufacturers sell drugs to the government at a percentage discount off the average price paid in the private market Should they pursue this pricing program? Why or why not? What effect would such a plan have on prices?
C. Pharmastan is worried about spending under the plan but does not want to impose high cost sharing on the beneficiaries of the plan. What plan design option could Pharmastan pursue? How would implementing this option affect plan spending?
D. Some in the Pharmastan government believe that generic competition will bring down health care prices. Is this true? Why or why not?